

ABSTRACT

Background : Laboratory testing requires accurate and stable control materials to ensure the quality of results. However, commercial control materials are often expensive and difficult to obtain, making more economical alternatives necessary. EDTA plasma, which is commonly considered waste, has the potential to be used as a control material, but its homogeneity and stability need to be evaluated.

Objective: To determine the homogeneity and stability of pooled EDTA plasma as an alternative control material for urea level testing.

Methods: This study used a pre-experimental design with a one group pretest-posttest approach. EDTA plasma samples were collected from students and pooled. Homogeneity was tested using ISO 13528, while stability was assessed after storing the pooled plasma at -20°C for 1, 2, 3, and 4 weeks. Urea levels were measured using an enzymatic method with a UV-Vis spectrophotometer.

Results: The results of the homogeneity test showed that the pooled EDTA plasma met the homogeneity criteria, with a standard deviation between samples (S_s) $\leq 0.3\sigma$, i.e., $0.346 \leq 0.79228$. The stability test indicated that the EDTA plasma remained stable up to the third week, as it met the stability test requirement of $|X_r - Y_r| \leq 0.3\sigma$. However, it was not stable in the fourth week, as it failed to meet the stability requirement, with a result of $|X_r - Y_r| = 1.158 > 0.3\sigma$.

Conclusion: Pooled EDTA plasma is homogeneous and stable for up to 3 weeks when stored at -20°C.

Keywords: Pooled EDTA plasma, homogeneity, stability, urea, laboratory control material.

ABSTRAK

Latar Belakang: Pemeriksaan laboratorium memerlukan bahan kontrol yang akurat dan stabil untuk menjamin mutu hasil. Namun, bahan kontrol komersial kerap kali mahal dan sulit diperoleh, sehingga dibutuhkan alternatif yang lebih ekonomis. Plasma EDTA yang umumnya menjadi limbah berpotensi dapat dimanfaatkan sebagai bahan kontrol, namun perlu dikaji homogenitas dan stabilitasnya.

Tujuan: Mengetahui homogenitas dan stabilitas *pooled* plasma EDTA sebagai bahan kontrol alternatif untuk pemeriksaan kadar ureum.

Metode: Penelitian ini menggunakan desain pre-eksperimental dengan rancangan one group pretest-posttest. Sampel plasma EDTA dari mahasiswa dikumpulkan, kemudian diuji homogenitasnya menggunakan metode ISO 13528. Untuk uji stabilitas, *pooled* plasma disimpan pada suhu -20°C selama 1, 2, 3, dan 4 minggu, kemudian kadar ureum diukur dengan metode enzimatis menggunakan spektrofotometer UV-Vis.

Hasil: Hasil uji homogenitas menunjukkan bahwa *pooled* plasma EDTA memenuhi syarat homogen dengan nilai standard deviation between samples (S_s) $\leq 0,3\sigma$ yaitu $0,346 \leq 0,79228$. Uji stabilitas menunjukkan bahwa plasma EDTA stabil hingga minggu ke-3 karena memenuhi syarat uji stabilitas yaitu $|X_r - Y_r| = \leq 0,3 \sigma$, tetapi tidak stabil pada minggu ke-4 karena tidak memenuhi syarat uji homogenitas dengan hasil $|X_r - Y_r| = 1,158 > 0,3\sigma$.

Kesimpulan: Pooled plasma EDTA homogen dan stabil hingga penyimpanan 3 minggu pada suhu -20°C .

Kata Kunci: Pooled plasma EDTA, homogenitas, stabilitas, ureum, bahan kontrol.